Courier Radio
PARTS LIST
and SERVICE MANUAL

Courier Model 651

United Reproducers Corporation

SPRINGFIELD, OHIO

SERVICE POLICY

That more efficient and prompt service may be furnished our customers, service stations supervised by factory trained technicians have been located in various localities in the country and are distinct factory branches,

The territory is divided into two divisions, Eastern and Western.

The states of New York, Pennsylvania, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Maryland, Delaware, New Jersey, Connecticut, Rhode Island, Massachusetts, Vermont, Maine, and New Hampshire, will be served from Rochester, N.Y. and New York City.

The states west not mentioned above, will be served from stations located at Ann Arbor, Michigan, St. Charles, Illinois, Denver, Colorado, Kansas City, Missouri, Dallas, Texas and San Francisco, California.

The service manager for the Eastern division will be located at Rochester, N.Y. and the Western service manager at Ann Arbor, Michigan.

COMPLAINTS

Please address service complaints to the service manager located in your territory.

PARTS ORDERS

Parts orders are to be mailed to service station nearest you.

MERCHANDISE RETURNED FOR SERVICING

All receivers and speakers returned to the company for servicing are to be returned direct to service station in your territory.

Transportation charges must be prepaid. In instances where collect shipments are received, the customer will be invoiced for in-coming shipment.

Any and all shipments made direct to a service station will be returned to the customer after the proper servicing has been made.

CREDIT AND ADJUSTMENT

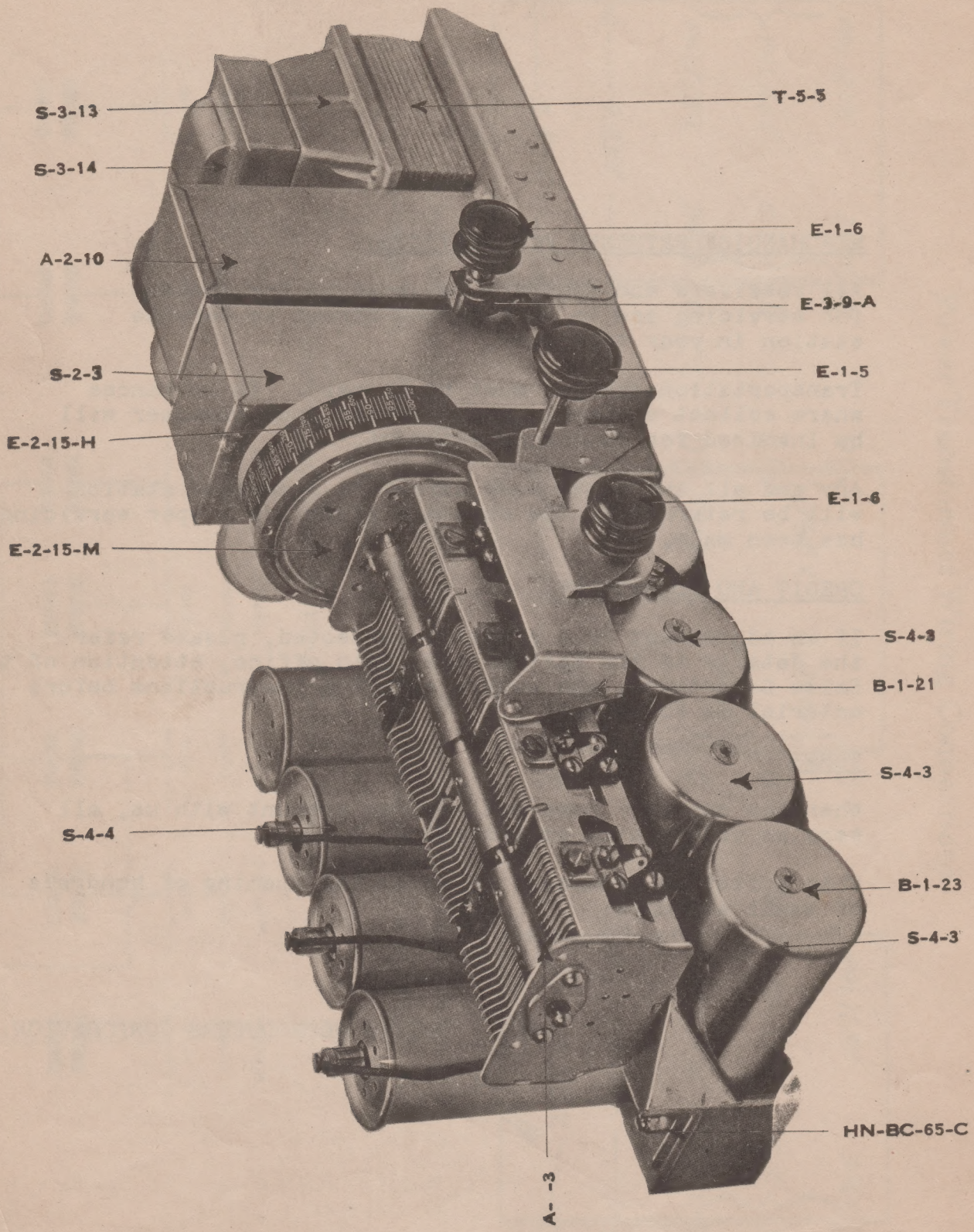
If an adjustment or a credit is expected, please refer the details to the Springfield, Ohio office, attention of the Sales Department, and secure shipping instructions before material is forwarded.

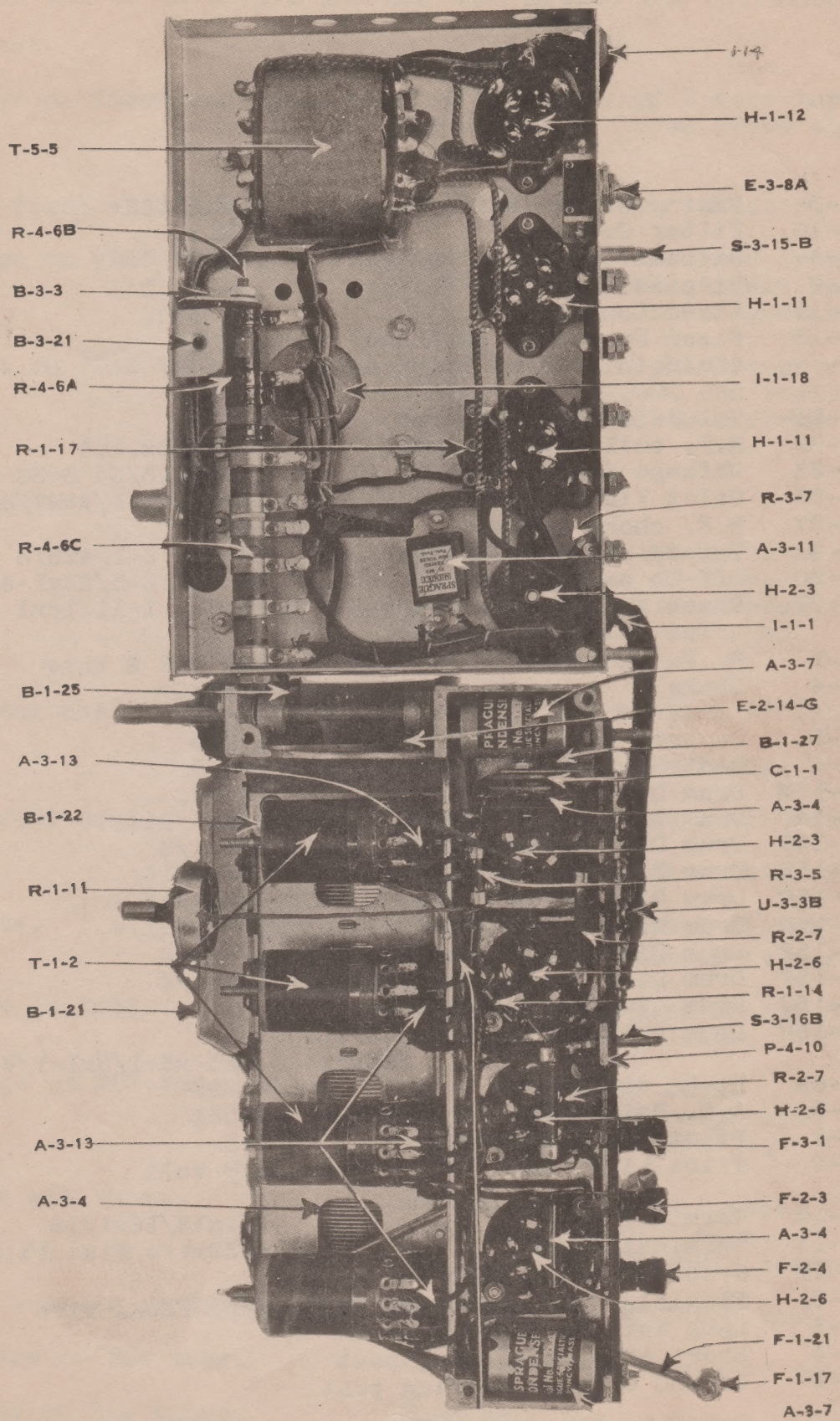
TERMS

When the customer does not have an account with us, all service orders will go forward C. O. D.

This policy is necessary to avoid the opening of hundreds of small accounts.

UNITED REPRODUCERS CORPORATION


S-3-13
T-5-5
S-3-14
E-1-6
A-2-10
E-3-9-A
S-2-3
E-1-5
E-2-15-H
E-1-6
E-2-15-M
S-4-3
B-1-21
S-4-3
S-4-4
B-1-23
S-4-3
HN-BC-65-C


I-1-4
H-1-12
T-5-5
E-3-8A
R-4-6B
S-3-15-B
B-3-3
H-1-11
B-3-21
R-4-6A
I-1-18
R-1-17
H-1-11
R-3-7
R-4-6C
A-3-11
H-2-3
I-1-1
A-3-7
B-1-25
E-2-14-G
B-1-27
A-3-13
C-1-1
A-3-4
B-1-22
H-2-3
R-3-5
R-1-11
U-3-3B
R-2-7
T-1-2
H-2-6
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H-2-6
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F-3-1
F-2-3
A-3-4
A-3-4
F-2-4
H-2-6
F-1-21
F-1-17
A-3-7

COURIER RADIO PARTS LIST AND SERVICE MANUAL

MODEL 65 COURIER
Parts Price List

A-1-3	Tuning Condenser (4 gang)	4 x.22235	12.35
A-2-10	Filter Condenser	7 Mfd.	8.50
A-3-4	Bi-pass Condenser (Midget)	.00025	.30
A-3-7	Bi-pass Condenser (3 tap)	.1-.1-.1	1.30
A-3-11	Fixed Condenser	.01 Mfd.	.55
A-3-13	Fixed Condenser (Matched) (Sold in sets of three only)	.00035	.90
B-1-21	Volume control bracket	16 Ga.	.12
B-1-22	R.F. coil support rods	3-21/32x.164	.05
B-1-23	Chicago female screws	11/32x13/64 8-32	.18
B-1-25	Pilot light bracket	18 Ga. 2-1/4"x7/8"	.18
B-1-27	R.F. choke bracket	.0312	.09
B-3-3	Tapped resistor bracket	16 Ga. 2-1/4x5/8	.03
B-3-20	Off-On switch bracket	18 Ga. 2-5/32x1-6/16	.03
B-3-21	Chassis hold down bracket	16 Ga. 1-11/16x1	.02
C-1-1	R. F. choke coil	100'#36 E wire	.55
C-2-4	Choke	M.#320	2.70
E-1-5	Control knob	1-3/8	.23
E-1-6	Control knob	1-1/8	.18
E-2-15M	Drum Dial & Hub	26 Ga.	.45
E-2-14F	Drum Dial Drive Cord	1/16" Dim.	.05
E-2-14G	Drum Dial Idler Pulley	5/8x1/8	.10
E-2-15B	Drum Dial Groove pins	.64x3/16	.05
E-2-15C	Drum Dial Drive Pulley	5/8x9/16	.08
E-2-15D	Drum Dial Drive Shaft	5-3/16x1/4	.06
E-2-15E	Drum Dial Drive Shaft Collar	5/8x3/8	.05
E-2-15F	Drum Dial Coiled Tension Sp.	5/8x1/4	.05
E-2-15J	Drum Dial Retaining Disc.		.05
E-2-15H	Drum Dial Calibration Strip (with disc).	.025 x8-1/2x1-1/4	.20
E-3-8A	Hi-Lo switch	21349	.80
E-3-9A	A.C. Rotary action switch	#1561	.65
E-4-1	Pilot Light socket	#15	.13
E-4-2	Pilot Light Bulb	3/8 volt	.22
F-1-10	Terminal lugs	1/4x13/16x1/16	.01
F-1-11	Terminal screws	6/32x1/4 Flat Fi.Hd.	.01
F-1-17	Grid connector caps		.05
F-1-21	Flexible Grid connector (with cap)	Flex. wire	.10
F-2-3	Long antenna binding post		.22
F-2-4	Short antenna binding post		.22
F-3-1	Ground antenna binding post		.22

H-1-11	245 Tube socket	#245 Type 6-27	.28
H-1-12	280 Tube socket	#280 Type 6-27	.28
H-2-3	227 Tube socket	#227 Type 6-27	.30
H-2-6	224 Tube socket	#224 Type 6-27	.30
HN-BC-65-C	Cap nuts	6-32	.03
I-1-1	Grommets	21/64	.02
I-1-3	Shouldered washers	3/8x.144x5/16	.01
I-1-4	Grommets	27/64	.02
I-1-8	Resistor spacer washer	9/16x3/16x1/16	.01
I-1-13	Grommets	19/32	.02
I-1-14	Insulating washer (vol.Control)	3/4x3/8x1/32	.01
I-1-18	Grommets	1/2	.02
I-1-19	Fibre washer (vol. control)		.05
K-1-7	Serial number name plate	1-3/4x2-1/4	n/c
K-1-8	License plate	1-3/4x2-1/4	n/c
K-3-7	Courier Drum Dial escutcheon plate		.32
P-4-10	Terminal Plate Strip	1x9-3/4x1/8	.33
P-4-13	Dynamic terminal strip	3/4x4-3/4x1/16	.10
R-1-11	Volume controls	5500 ohms	.87
R-1-11B	Hex nut for Vol.Control	Special	.05
R-1-14	60 ohm resistor	#A-60 wire	.20
R-1-17	10 ohm C.T.Resistor	#810-C	.25
R-2-7	5000 ohm resistor	Standard 1 Watt	.35
R-3-5	75,000 ohm resistor	Midget	.34
R-3-7	1/4 Meg. resistor	Midget	.34
R-3-8	900 ohm Flexible resistor	4-3/4 to 5"length	.25
R-4-6A	227,690 ohm resistor	Tapped (100M, 50M 50M 25M 40&2650M)	2.16
R-4-6B	Through Support rod	8-32x6-1/8 (threaded at both ends)	.11
R-4-6C	225,000 ohm resistor	Tapped (100M,50M, 50M & 250M)	1.28
R-4-9	2690 ohm resistor	Tapped (40 & 2650 ohms)	.64
S-7-3	Audio transformer case	26 Gauge	.48
S-2-3A	Audio transformer case top	26 Gauge	.10
S-3-13	Power transformer housing		.40
S-3-14	Choke Case	24 Gauge	.33
S-3-15	Power Pack U channel	6-3/8x1-1/64x22 Ga.	.10

S-3-15B	P.P. U channel studs	3/16 Th.500 Stud 3/16x3/16	.05
S-3-16	Tuner Pack U channel	4-15/16x1-1/64x22 Ga.	.10
S-3-16B	Tuner Pack U channel stud	3/16 Th.500 Stud x1/2 Thx3/16	.05
S-4-3	R.F. Trans.coil shields	2-1/4x3-3/8x20 Ga.	.14
S-4-4	Tube shields	1-7/8x4-1/16x30 Ga.	.10
SS-105	Hex head set screws	10/32x5/16	.05
SS-104	Headless set screws	10/32x1/4	.05
T-1-2	R.F. coils (matched)	per set of four	4.80
T-5-5	Power transformer (Dynamic)	T-3748	8.60
T-3-4	Audio transformer (PP Input)	M#343	3.64
U-3-3B	Connector cable assembly	6 leads	.44
U-3-5	Dynamic speaker cable	3' long	.50
U-3-4	A.C. Cord & Male plug	8' long	.84
W-1-1	Black Hook Up wire	#20 Solid	
W-1-2	Green Hook Up wire	#20 Solid	
W-1-3	Red Hook Up wire	#20 Solid	
W-1-4	Blue Hook Up wire	#20 Solid	
W-1-5	Yellow Hook Up wire	#20 Solid	
W-1-7	Brown & White Hook Up wire	#20 Solid	
W-1-8	Green & White Hook Up wire	#20 Solid	
W-1-9	Red & White Hook Up wire	#20 Solid	
W-1-14	Blue Alphex Hook Up wire	#20 Solid	
W-1-17	Red Alphex Hook Up wire	#20 Solid	
W-1-18	Yellow Alphex Hook Up wire	#20 Solid	
W-1-19	Black Alphex Hook Up wire	#20 Solid	
W-1-20	Green Alphex Hook Up wire	#20 Solid	
	Per 100 Foot lengths		1.56
W-1-21	Black Filament Hook Up wire	#16 per 100 Feet	1.72
W-1-22	Bus Bar	per 100 Feet	1.60
W-4-2	Black Flexible wire	#18 stranded per 100 Feet	1.46
WS-B-5	Washers	5/16x.142x.028	.87

ADDITIONAL PARTS ON K-65 POWER PACK

A-3-6	1/2 Mfd. 1000 volt speaker condenser	2.48
C-2-6	Choke coil	4.37
H-1-13	199 tube socket	.27
P-4-14	Speaker terminal plate	.05
R-3-7	1/2 Meg. resistor	.33
T-4-3	Audio transformer (P.P. Output)	3.64
T-5-7	Power transformer	8.60

BALANCING TUNING STAGES-

To assist in synchronizing the tuning stages, four compensating or trimmer condensers are used, being located on the front of the variable condenser, as illustrated in figure 1.

However, the receiver is placed in complete resonance before it leaves the factory and no adjustment should be necessary except in cases where some part has been replaced, and then only when the set does not respond to some station as it should. None other than an experienced technician should attempt this adjustment, since if one does not fully understand what he is doing, greater harm than good will result.

In order that the Courier receiver be accurately synchronized or each tuning stage work in step, two conditions are necessary.

First- The coils must be accurately matched. This is done at the factory, to .43% (43/100 of 1%) inductance.

Second- Each section of the tuning condenser must have equal capacities at any dial setting. The tolerance here, also, is held extremely small at the factory or within one micro-microfarad capacity.

To compensate for any slight difference in capacity that may occur, trimmer condensers have been added to provide vernier adjustment.

Remove the chassis from the cabinet, tune in a weak signal at or near the top, not lower than 1450 on the dial.

If the adjustment is made at a lower point, the reception will be weak or the set may be dead upon the top end.

Each of the four trimmer condensers should not be changed in turn for maximum response on the received signal, exactly as one would tune a three dial receiver.

Accidents or replacements of parts may throw the set out of balance, necessitating adjustment other than the above. Such adjustment should never be attempted by any, other than an experienced service man and by these men very cautiously.

KYLECTRON SPEAKER

In the event of trouble, presumed to be in the Kylectron speaker, the following steps should be taken:

(a) Reverse the polarizing switch. If this improves the quality of reception and clears up the trouble, leave the switch in this changed position.

(b) If the trouble persists, connect another speaker to the set to determine if the trouble is in the speaker. A faulty section may be found by disconnecting each section in turn, and the faulty section may be replaced. In an emergency, the speaker may be operated with a section disconnected.

(c) If the trouble appears to be in the receiver, try replacing the 199 tube, as a faulty tube here will result in poor quality from the speaker. Try a 120 tube in place of the 199.

(d) The voltage across the speaker is from 600 to 630, but can be accurately measured only with an electrostatic voltmeter, or by a V.T. voltmeter equipped with a "D.C. Bucking potential". If such a meter is available it will be found very useful in locating these troubles. The potential at the speaker must be <u>at least</u> 500 volts (measured with the antenna disconnected from the receiver) and a voltage below this indicates either (1) leakage in the speaker or leads; (2) leakage in the receiver; (3) faulty 199 tube; (4) a broken connection or transformer winding in the receiver.

PARTS THAT MAY BE DEFECTIVE AND HOW THEY EFFECT THE RECEIVER

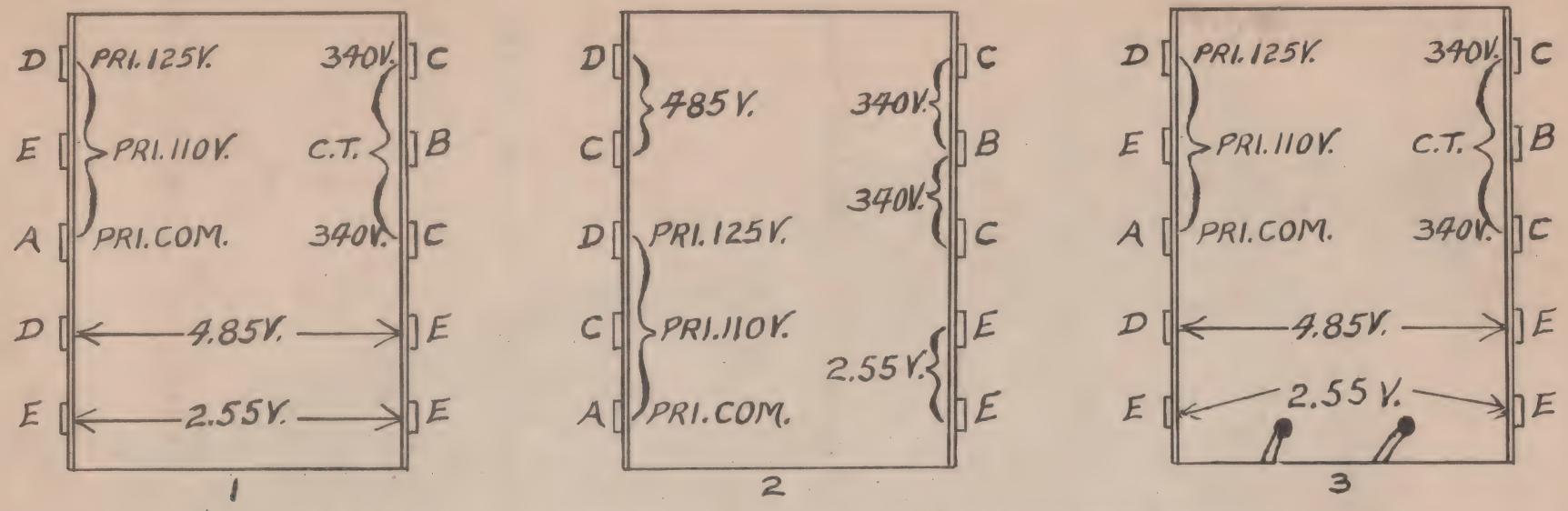
Effect	Cause
No plate voltage on first audio tube.	Open primary of 5 wire input transformer. Open 25000 ohm resistor.
No "C" bias on first audio tube.	Shorted.1000 ohm resistor.
No plate voltage on #245 tube.	Open winding on 3 lead transformer. (Output push-pull in set on Kylectro (in speaker on D.C. dynamic)
No grid voltage on #245 tube.	Open 5 lead in-put transformer or defective 100,000 ohm resistor or grounded 5 lead transformer or resistor.
Rectifier tube burns with blue haze.	Ionization.
Ionization.	Grounded or shorted filter choke coil. Short in plate of tube. Short in filter condenser. Excessive plate voltage. Gas in tube.
2650 ohm resistor heats excessively.	Short in 3rd section of filter condenser. Short in tuner B- leads.
25000 ohm resistor heats excessively.	Short in 4th section of filter condenser. Short in 1st audio plate circuit.
Choke coil heats.	Grounded or shorted filter choke Short in 2nd section filter condenser.
Low "B" voltage in tubes.	Grounded somewhere in circuit. Low A.C. line voltage.
No plate voltage on 227 tube.	Open R.F. choke coil. Open 50,000 ohm resistor. Short in plate circuit.
High Voltage on all tubes	Ground on grid bias poor. High A.C. line voltage. Hi-Lo suited in wrong position.
No screen grid voltage on 224 tubes.	One 5000 ohm resistor open
High S.G. voltage on 224 tube.	Other 5000 ohm resistor open.
No plate voltage on 224 tubes.	Open 2650 ohm resistor Open 900 ohm resistor in 3rd R.F. plate circuit. Open primary in R.F. coils.

TROUBLES THAT MAY OCCUR IN A RECEIVING SET AND PROBABLE CAUSES

1.	Tubes fail to light.	(a). D.C. instead of A.C. current. (b). Defective tubes. (c). Defective power transformer. (d). Loose connection or broken wire between tube and power transformer. (e). Open lead in A.C. plug cord.
2.	Tubes light, no reception.	(a). No antenna or ground connection. (b). Defective tube. (c). Open circuit in primary of audio, or R.F. transformers. (d). Poor ground connection in set, especially at grid bias resistances. (e). Shorted grid circuit. (f). Open secondary in power transformer. (g). Open filter choke. (h). Broken connections.
3.	Weak reception.	(a). Atmospheric condition. (b). Poor contacts in antenna or grounding systems or grounded antenna. (c). Defective tube. (d). A.C. switch turned on HI., causing voltage in set to be too low. (e). Open bi-pass condenser. (f). Open audio transformer (push-pull). (g). Power transformer defective. 1. Current delivered by one side of rectifier tube only. 2. Open secondary on one side. 3. Short in transformer. (h). Open R.F. coil. (i). Antenna post grounded. (j). Tuning condenser out of resonance. (k). Scratched R.F. coil, shorting the turns. (l). Incorrect plate voltage. Too high as bad as too low. (m). Incorrect "C"bias.
4.	Distorted signals.	(a). Heterodyning of interfering station. (b). Set out of resonance. (c). Defective tube. (d). Open grid bias resistance. (e). Shorted grid leads. (f). Defective speaker. (g). Volume control advanced beyond overload point.
5.	Noisy reception.	(h). Interference from outside sources. (i). Loose contact in ground or antenna system.

		(c). Broken connection in set. (d). Defective condensers. (e). Defective audio transformer.
6.	Bad hum.	(a). Defective tube. (b). Filament circuit grounded. (c). Low emission rectifier tube. (d). Low emission amplifier tube. (e). Filter condenser not properly grounded. (f). "C" bias not properly grounded. (g). Defective speaker. (h). Open or shorted filter condenser. (i). Shorted or grounded filter choke coil. (j). Defective C. T. resistance
7.	Howling noises.	(a). Dirty solder joints, making short. (b). Microphonic tube. (c). Open grid circuit. (d). Open plate circuit in detector. (e). No bias on audio transformer. (f). High resistance connection in grid circuit. (g). Excessive plate voltage. (h). Faulty ground in audio or filter.
8.	Broad tuning.	(a). Aerial too long (see instructions.) (b). Aerial not properly insulated or too close to metal or trees. (c). Poor ground. (d). Out of resonance. (e). Location and operation of broadcast stations.
9.	Intermittent reception.	(a). Defective tube. (b). Defective filter condenser. (c). High resistance joint. (d). Loose connection. (e). Open biasing resistance.
10.	Oscillation.	(a). Shields not on tubes. (b). High voltages on screen grid tubes. (c). Shorted .00025 or .00035 across primary of R.F. coils. (d). .1 condenser defective. (e). Set not properly grounded. (f). Defective R.F. tubes.
11.	Tuning assembly trouble.	(a). Tension increased or lessened on contact springs. (b). Shorten drive cord spring to prevent slipping. (c). Oil drive pulleys to stop squeaking.

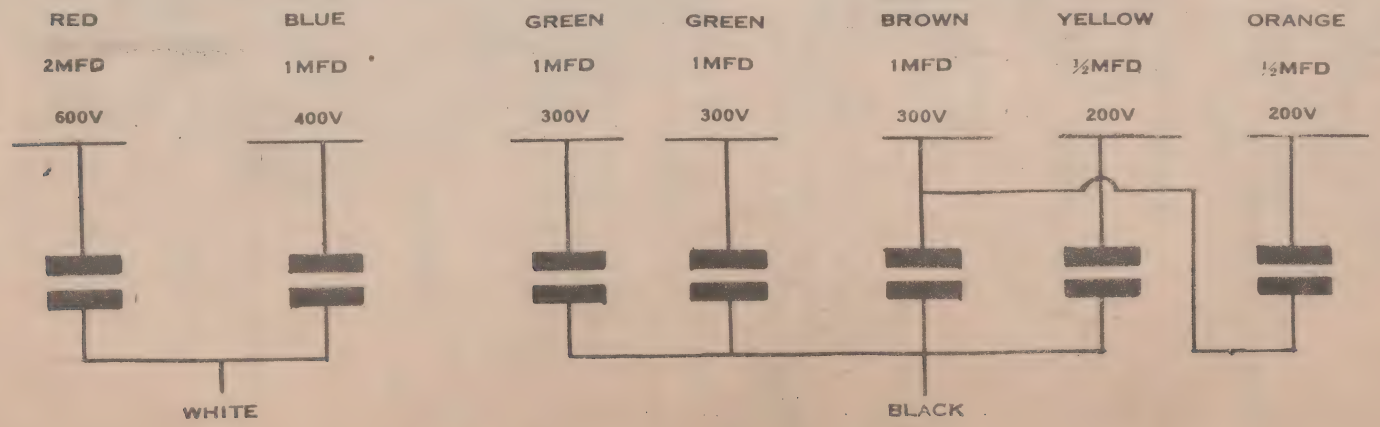
Power Transformer Wiring Connections

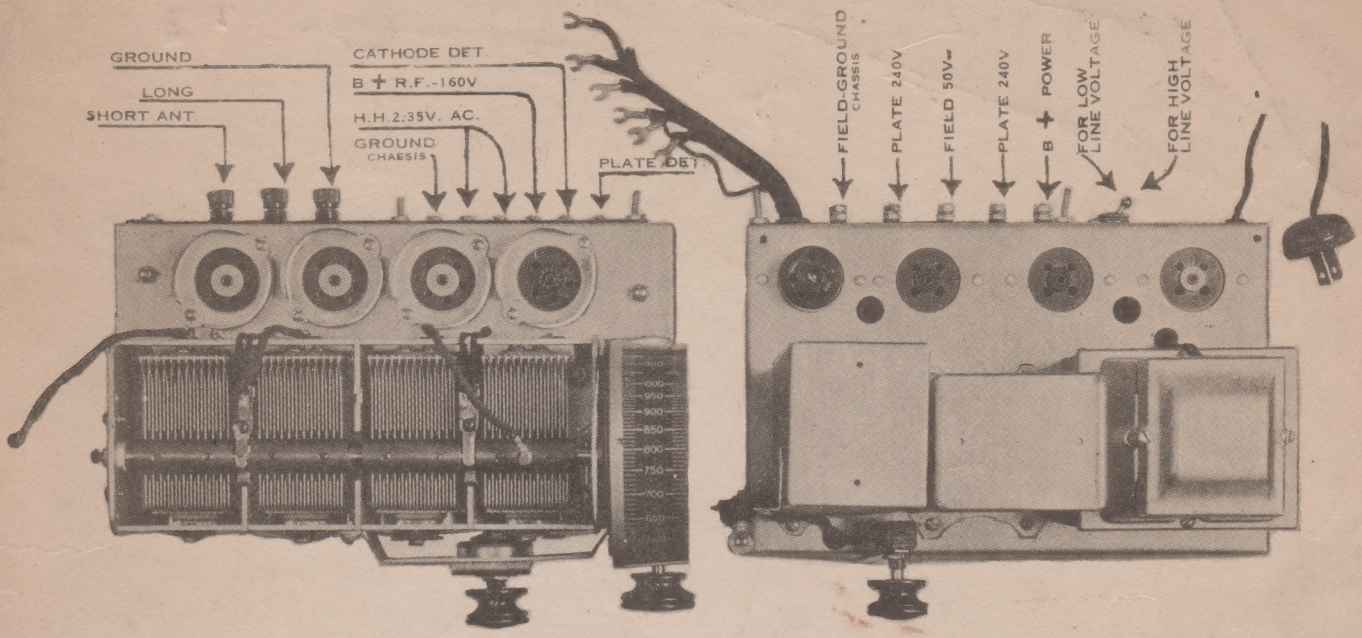


No. 1 and 2—as used with Dynamic Speaker. No. 3—as used with Kylectron.

A—Black Wire B—Red Wire. C—Green Wire. D—Black and White Wire.
E—Green and White Wire.

Filter Condenser Wiring Connections





Average Voltage Readings

Filament	280	4.85 v. A.C.	Measure	across	socket
"	245	2.45 v. A.C.	"	"	"
"	1st A.F.	2.45 v. A.C.	"	"	"
"	Det. & 224's	2.35 v. A.C.	"	"	"

When all tubes light, measurement H-H (2.35 v.) as shown in drawing above, is ordinarily sufficient and can be taken without removal of set from cabinet.

245 plate	240 v. D.C.	As shown above, plate to chassis
245 grid	-50 v. D.C.	As shown above, field to chassis
1st A.F. plate	65 v. D.C.	Plate to cathode
1st A.F. grid	-3 1/2 v.D.C.	Cathode to chassis
Det. plate	vary widely with different meters approximately 45 volts.	Plate to cathode
Det. grid	Vary widely with different meters	Cathode to chassis

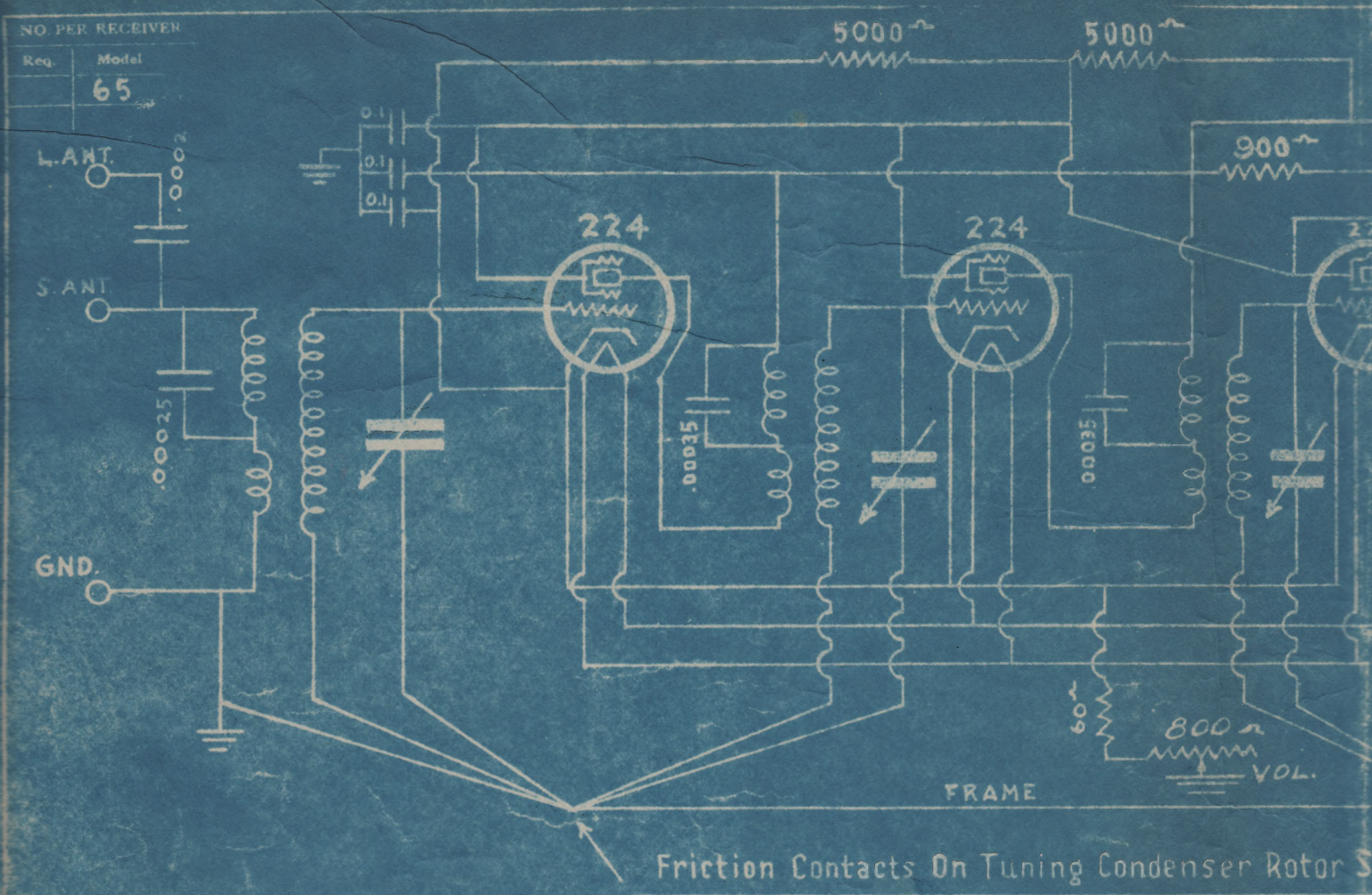
Note:- In taking readings, have all tubes in place, and the speaker connected; place the Hi-Lo switch in proper position to agree with your line voltage.

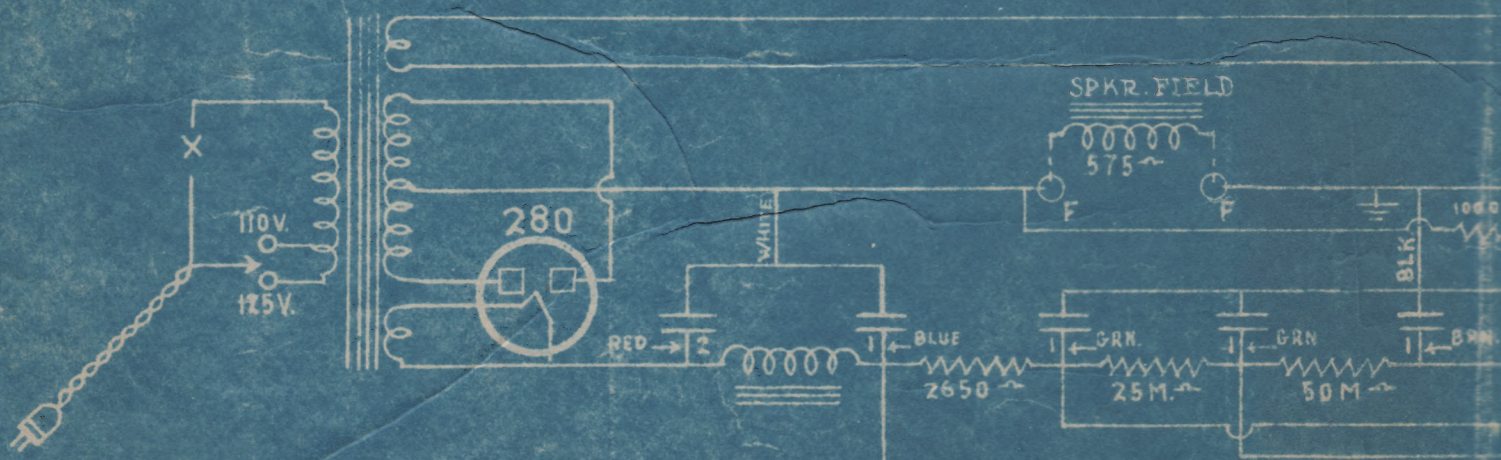
All D.C. voltages must be measured with a voltmeter having 800 to 1000 ohms per volt, otherwise the readings will not be correct.

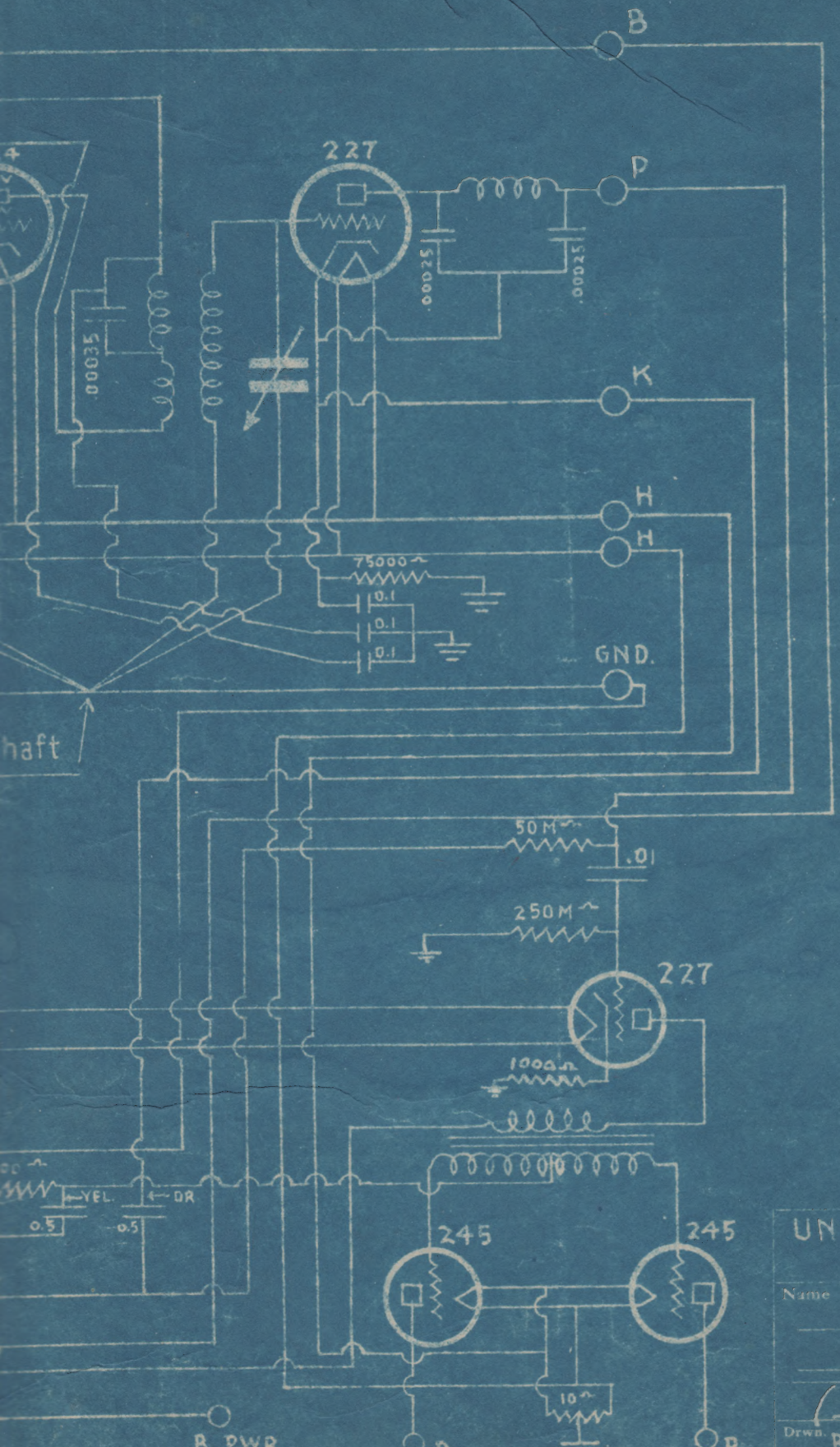
224 plate	160v	Plate to cathode
224 grid (control)	1.5 v. to 20 v. according to position of volume control.	Cathode to grid clip
224 grid (screen)	0-75 v.	Cathode to grid contact of socket.

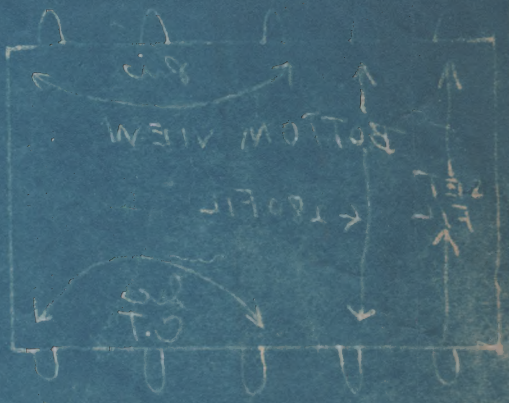
NO. PER RECEIVER

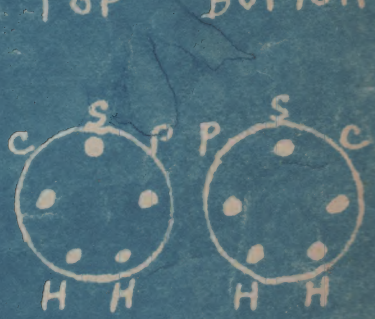
Req.	Model
	65











UNITED REPRODUCERS CORP.
ARBORPHONE DIVISION

Name CIRCUIT DIAGRAM
MODEL 65
(DYNAMIC)

Drwn.	Appr.	Date	Scale
RBA		6/24/29	

Part No. Drwg. No.